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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/735,840

12/13/2000

Takeo Nozaki

P/1912-20

5830

7590

01/18/2005

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EXAMINER

HESELTIME, RYAN J

ART UNIT

PAPER NUMBER

2623

DATE MAILED: 01/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/735,840	Applicant(s) NOZAKI, TAKEO	
	Examiner Ryan J Hesselline	Art Unit 2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 August 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
 4a) Of the above claim(s) 1,5 and 9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-4,6-8 and 10-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 December 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's amendment to the specification, filed August 18, 2004, with respect to the abstract has been fully considered. The objection to the specification has been withdrawn.
2. Applicant's arguments on pages 4-5, filed August 18, 2004, with respect to the rejection(s) of claim(s) 2-4, 6-8 and 10-12 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Chiu et al. (USPN 5,917,934).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2-4, 6-8 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nozaki et al. (EP 899,559, cited on applicant's IDS, hereafter Nozaki) in view of Chiu et al. (USPN 5,917,934, newly cited, hereafter Chiu).
5. Regarding claims 2, 6, and 10, Nozaki discloses a pattern inspection method, device, and computer readable medium storing a pattern inspection program which, by controlling the computer, scans (4) the inspected pattern formed on a substrate according to the design data with the laser beam and receives the light passed through said substrate with the light receiving device (5) and, from the pattern information obtained by said light receiving device, generates the image of the inspected pattern (15) and, for coincidence between this image and the reference data (12)

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obtained by imaging of said design data, corrects said reference data to generate the reference image (13) and compares the image of said inspected pattern and the reference image to detect any defects of the inspected pattern (page 3, line 35-44) wherein said reference image generation comprising provision to each pixel of sub-pixels dividing the pixel to form a matrix and calculation of the gray level of the pixel based on the number of sub-pixels belonging to the pattern developed in each pixel (Figures 2-4; page 3, line 50-page 4, line 14) and calculation of the pattern width for said inspected pattern and for the reference data at the position at the corresponding position (page 4, line 19-39).

6. Nozaki discloses that the gradation value of each pixel is calculated by the number of sub-pixels set in each pixel (Figure 3; page 3, line 55-page 4, line 7), but does not explicitly disclose that the width of the pattern developed in the pixel is obtained by dividing said gray level by the gray level step count. Chiu discloses an automated visual inspection apparatus for detecting defects and measuring defect size wherein calculation of the pattern width (size/area) for said inspected pattern and for the reference data at the position at the corresponding position by treating the number obtained by dividing said gray level (light intensity) by the gray level step count (saturated intensity value) as the width (size/area) of the pattern developed in that pixel (column 20, line 41-56). Chiu also discloses calculating the width of the potential defect (column 14, line 44-column 15, line 46; column 20, line 16-31). The examiner realizes that Chiu does not explicitly disclose that the size that is calculated by dividing the light intensity by the saturated light intensity is the width, but it is believed that the width can be determined from this size value. Note that the term "gray level step count" is not explicitly defined in the claims, however, even if it were, the examiner believes that Chiu's saturated light intensity would still

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satisfy the limitation since by dividing the intensity value by the saturation value, the absolute width (size/area) of the potential defect is determined as a proportion of the total area of the pixel. It would have been obvious to one of ordinary skill in the art at the time the invention was made to calculate the width of the pattern by dividing the gray level by the gray level step count as taught by Chiu in order to generate a more exact estimate of the size of a potential etch defect represented by a pair of blobs by utilizing the light intensity data of the pixels forming each blob (column 20, line 41-56).

7. Regarding claims 3, 7, and 11, Nozaki discloses that the gray level of each pixel is calculated from the number of sub-pixels belonging to said inspected pattern (Figures 2-4; page 3, line 50-page 4, line 14) and, Chiu discloses treating the count obtained by dividing this gray level (intensity value) by the gray level step count (saturated intensity value) as the pattern width (size/area) of the inspected pattern developed in the pixel, the pattern width of said inspected pattern is calculated and the gray level of each pixel is calculated from the number of sub-pixels belonging to said reference data pattern and, treating the count obtained by dividing this gray level by the gray level step count as the pattern width of the reference data developed in the pixel, the pattern width of said reference data is calculated (see above discussion of claims 2, 6, and 10).

8. Regarding claims 4, 8, and 12, Nozaki discloses that the pattern correction width of said reference data is calculated from the difference between the pattern width of said inspected pattern and the pattern width of the reference data (page 4, line 19-39).

Conclusion

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9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- USPN 5,237,650 to Priem et al. discloses a method and apparatus for spatial anti-aliased depth cueing wherein objects receive intensity values that depend on the number of subpixels covered by the object.
- USPN 5,726,443 to Immega et al. discloses a vision system and proximity detector wherein if a spot is detected by several sensor portions in the detector, a reading of gray-scale values will allow sub-pixel interpolation.
- USPN 6,071,652 to Feldman et al. discloses fabricating optical elements using a photoresist formed from contact printing of a gray level mask including a prior art method in which each pixel is divided into sub-pixels, which are then sub-divided into gray scale resolution elements.
- USPN 6,583,897 to Harrington discloses a non-local approach to resolution enhancement wherein the run length value for each pixel in a scan line is determined by starting a counter and assigning its value to the pixel at the end of the scan line.
- JP 55-150667 to Fukinuki et al. discloses a picture signal quantizing system wherein a circuit measures distribution of brightness of the picture and the size of the picture pattern quantitatively on the basis of the number of picture elements having a level higher than a threshold.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan J Hesseltine whose telephone number is 703-306-4069.

The examiner can normally be reached on Monday - Friday, 8:30 AM - 5 PM.

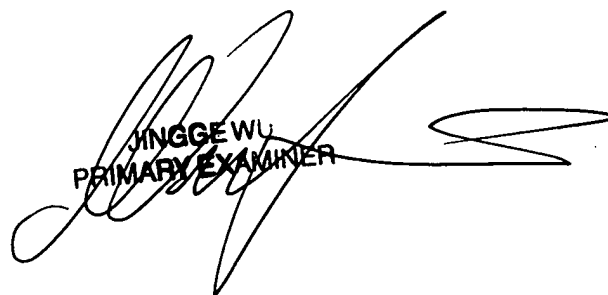
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ryan J. Hesseltine
January 11, 2005

JINGGE WU
PRIMARY EXAMINER

A handwritten signature in black ink, appearing to read 'Jingge Wu', is written over a rectangular stamp that contains the text 'JINGGE WU' and 'PRIMARY EXAMINER'.